



## SEQUENCE LISTING

&lt;110&gt; Griffith, Edwin J et al.

&lt;120&gt; T CELL EPITOPES OF RYEGRASS POLLEN ALLERGEN

&lt;130&gt; IMI-040CP3

&lt;140&gt; 08/737,904

&lt;141&gt; 1996-11-20

&lt;150&gt; 08/106,016

&lt;151&gt; 1993-08-13

&lt;160&gt; 60

&lt;170&gt; PatentIn Ver. 2.0

&lt;210&gt; 1

&lt;211&gt; 1229

&lt;212&gt; DNA

&lt;213&gt; Escherichia coli

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (40)..(942)

&lt;400&gt; 1

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Met Ala Val Gln Lys  
1 5

tac acg gtg gct cta ttc ctc gcc gtg gcc ctc gtg gcg ggc ccg gcc 102  
Tyr Thr Val Ala Leu Phe Leu Ala Val Ala Leu Val Ala Gly Pro Ala  
10 15 20

gcc tcc tac gcc gct gac gcc ggc tac acc ccc gca gcc gcg gcc acc 150  
Ala Ser Tyr Ala Ala Asp Ala Gly Tyr Thr Pro Ala Ala Ala Ala Thr  
25 30 35

ccg gct act cct gct gcc acc ccg gct gcg gct gga ggg aag gcg acg 198  
Pro Ala Thr Pro Ala Ala Thr Pro Ala Ala Ala Gly Gly Lys Ala Thr  
40 45 50

acc gac gag cag aag ctg ctg gag gac gtc aac gct ggc ttc aag gca 246  
Thr Asp Glu Gln Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys Ala  
55 60 65

gcc gtg gcc gcc gct gcc aac gcc cct ccg gcg gac aag ttc aag atc 294  
Ala Val Ala Ala Ala Ala Asn Ala Pro Pro Ala Asp Lys Phe Lys Ile  
70 75 80 85

ttc gag gcc gcc ttc tcc gag tcc tcc aag ggc ctc ctc gcc acc tcc 342  
Phe Glu Ala Ala Phe Ser Glu Ser Ser Lys Gly Leu Leu Ala Thr Ser  
90 95 100

gcc gcc aag gca ccc ggc ctc atc ccc aag ctc gac acc gcc tac gac 390

Ala Ala Lys Ala Pro Gly Leu Ile Pro Lys Leu Asp Thr Ala Tyr Asp  
105 110 115

gtc gcc tac aag gcc gcc gag ggc gcc acc ccc gag gcc aag tac gac 438  
Val Ala Tyr Lys Ala Ala Glu Gly Ala Thr Pro Glu Ala Lys Tyr Asp  
120 125 130

gcc ttc gtc act gcc ctc acc gaa gcg ctc cgc gtc atc gcc ggc gcc 486  
Ala Phe Val Thr Ala Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Ala  
135 140 145

ctc gag gtc cac gcc gtc aag ccc gcc acc gag gag gtc cct gct gct 534  
Leu Glu Val His Ala Val Lys Pro Ala Thr Glu Glu Val Pro Ala Ala  
150 155 160 165

aag atc ccc acc ggt gag ctg cag atc gtt gac aag atc gat gct gcc 582  
Lys Ile Pro Thr Gly Glu Leu Gln Ile Val Asp Lys Ile Asp Ala Ala  
170 175 180

ttc aag atc gca gcc acc gcc gcc aac gcc gcc ccc acc aac gat aag 630  
Phe Lys Ile Ala Ala Thr Ala Ala Asn Ala Ala Pro Thr Asn Asp Lys  
185 190 195

ttc acc gtc ttc gag agt gcc ttc aac aag gcc ctc aat gag tgc acg 678  
Phe Thr Val Phe Glu Ser Ala Phe Asn Lys Ala Leu Asn Glu Cys Thr  
200 205 210

ggc gcc gcc tat gag acc tac aag ttc atc ccc tcc ctc gag gcc gcg 726  
Gly Gly Ala Tyr Glu Thr Tyr Lys Phe Ile Pro Ser Leu Glu Ala Ala  
215 220 225

gtc aag cag gcc tac gcc gcc acc gtc gcc gcc gcg ccc gag gtc aag 774  
Val Lys Gln Ala Tyr Ala Ala Thr Val Ala Ala Ala Pro Glu Val Lys  
230 235 240 245

tac gcc gtc ttt gag gcc gcg ctg acc aag gcc atc acc gcc atg acc 822  
Tyr Ala Val Phe Glu Ala Ala Leu Thr Lys Ala Ile Thr Ala Met Thr  
250 255 260

cag gca cag aag gcc ggc aaa ccc gct gcc gcc gct gcc aca ggc gcc 870  
Gln Ala Gln Lys Ala Gly Lys Pro Ala Ala Ala Ala Ala Thr Gly Ala  
265 270 275

gca acc gtt gcc acc ggc gcc gca acc gcc gcc gcc ggt gct gcc acc 918  
Ala Thr Val Ala Thr Gly Ala Ala Thr Ala Ala Ala Gly Ala Ala Thr  
280 285 290

gcc gct gct ggt ggc tac aaa gcc tgatcagctt gctaataac tactgaacgt 972  
Ala Ala Ala Gly Gly Tyr Lys Ala  
295 300

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tcatgcagcc gcgatcgaga gggcttgcac gcttgtaata attcaatatt tttcatttct 1092

ttttgaatct gtaaatcccc atgacaagta gtgggatcaa gtcggcatgt atcaccgttg 1152

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1229

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<211> 301

<212> PRT

<213> Escherichia coli

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Met Ala Val Gln Lys Tyr Thr Val Ala Leu Phe Leu Ala Val Ala Leu  
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Val Ala Gly Pro Ala Ala Ser Tyr Ala Ala Asp Ala Gly Tyr Thr Pro  
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Ala Ala Ala Ala Thr Pro Ala Thr Pro Ala Ala Thr Pro Ala Ala Ala  
35 40 45

Gly Gly Lys Ala Thr Thr Asp Glu Gln Lys Leu Leu Glu Asp Val Asn  
50 55 60

Ala Gly Phe Lys Ala Ala Val Ala Ala Ala Ala Asn Ala Pro Pro Ala  
65 70 75 80

Asp Lys Phe Lys Ile Phe Glu Ala Ala Phe Ser Glu Ser Ser Lys Gly  
85 90 95

Leu Leu Ala Thr Ser Ala Ala Lys Ala Pro Gly Leu Ile Pro Lys Leu  
100 105 110

Asp Thr Ala Tyr Asp Val Ala Tyr Lys Ala Ala Glu Gly Ala Thr Pro  
115 120 125

Glu Ala Lys Tyr Asp Ala Phe Val Thr Ala Leu Thr Glu Ala Leu Arg  
130 135 140

Val Ile Ala Gly Ala Leu Glu Val His Ala Val Lys Pro Ala Thr Glu  
145 150 155 160

Glu Val Pro Ala Ala Lys Ile Pro Thr Gly Glu Leu Gln Ile Val Asp  
165 170 175

Lys Ile Asp Ala Ala Phe Lys Ile Ala Ala Thr Ala Ala Asn Ala Ala  
180 185 190

Pro Thr Asn Asp Lys Phe Thr Val Phe Glu Ser Ala Phe Asn Lys Ala  
195 200 205

Leu Asn Glu Cys Thr Gly Gly Ala Tyr Glu Thr Tyr Lys Phe Ile Pro  
210 215 220

Ser Leu Glu Ala Ala Val Lys Gln Ala Tyr Ala Ala Thr Val Ala Ala  
225 230 235 240

Ala Pro Glu Val Lys Tyr Ala Val Phe Glu Ala Ala Leu Thr Lys Ala

	245		250		255
Ile Thr Ala Met Thr Gln Ala Gln Lys Ala Gly Lys Pro Ala Ala Ala					
	260		265		270
Ala Ala Thr Gly Ala Ala Thr Val Ala Thr Gly Ala Ala Thr Ala Ala					
	275		280		285
Ala Gly Ala Ala Thr Ala Ala Ala Gly Gly Tyr Lys Ala					
	290		295		300

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<220>  
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<400> 3  
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 1 5 10 15

Ala Ala Thr Xaa  
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<210> 4  
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<400> 4  
 Ala Thr Xaa Ala Thr Pro Ala Ala Thr Xaa Ala Ala Ala Gly Gly Lys  
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Ala Thr Thr Asp  
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<220>  
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<400> 5  
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Asp Val Asn Ala

<210> 6  
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 <213> Escherichia coli

<400> 6  
 Glu Gln Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys Ala Ala Val  
     1                    5                    10                    15

Ala Ala Ala Ala  
                     20

<210> 7  
 <211> 16  
 <212> PRT  
 <213> Escherichia coli

<400> 7  
 Gly Phe Lys Ala Ala Val Ala Ala Ala Ala Asn Ala Pro Pro Ala Asp  
     1                    5                    10                    15

<210> 8  
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 <212> PRT  
 <213> Escherichia coli

<400> 8  
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     1                    5                    10                    15

Glu Ser Ser Lys  
                     20

<210> 9  
 <211> 20  
 <212> PRT  
 <213> Escherichia coli

<400> 9  
 Phe Glu Ala Ala Phe Ser Glu Ser Ser Lys Gly Leu Leu Ala Thr Ser  
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Ala Ala Lys Ala  
                     20

<210> 10  
 <211> 20  
 <212> PRT  
 <213> Escherichia coli

<400> 10

Gly Leu Leu Ala Thr Ser Ala Ala Lys Ala Pro Gly Leu Ile Pro Lys  
1 5 10 15

Leu Asp Thr Ala  
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<210> 11

<211> 20

<212> PRT

<213> Escherichia coli

<400> 11

Pro Gly Leu Ile Pro Lys Leu Asp Thr Ala Tyr Asp Val Ala Tyr Lys  
1 5 10 15

Ala Ala Glu Gly  
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<210> 12

<211> 20

<212> PRT

<213> Escherichia coli

<400> 12

Tyr Asp Val Ala Tyr Lys Ala Ala Glu Gly Ala Thr Pro Glu Ala Lys  
1 5 10 15

Tyr Asp Ala Phe  
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<210> 13

<211> 20

<212> PRT

<213> Escherichia coli

<400> 13

Ala Thr Pro Glu Ala Lys Tyr Asp Ala Phe Val Thr Ala Leu Thr Glu  
1 5 10 15

Ala Leu Arg Val  
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<210> 14

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<212> PRT

<213> Escherichia coli

<400> 14

Val Thr Ala Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Ala Leu Glu  
1 5 10 15

Val His Ala Val

<210> 15  
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Val Pro Ala Ala  
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<210> 16  
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 Lys Pro Ala Thr Glu Glu Val Pro Ala Ala Lys Ile Pro Thr Gly Glu  
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Leu Gln Ile Val  
                   20

<210> 17  
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Phe Lys Ile Ala  
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<210> 18  
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<400> 18  
 Asp Lys Ile Asp Ala Ala Phe Lys Ile Ala Ala Thr Ala Ala Asn Ala  
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Ala Pro Thr Asn  
                   20

<210> 19  
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<212> PRT  
<213> Escherichia coli

<400> 19  
Ala Thr Ala Ala Asn Ala Ala Pro Thr Asn Asp Lys Phe Thr Val Phe  
1 5 10 15

Glu Ser Ala Phe  
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<210> 20  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 20  
Asp Lys Phe Thr Val Phe Glu Ser Ala Phe Asn Lys Ala Leu Asn Glu  
1 5 10 15

Cys Thr Gly Gly  
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<210> 21  
<211> 20  
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<213> Escherichia coli

<400> 21  
Asn Lys Ala Leu Asn Glu Cys Thr Gly Gly Ala Tyr Glu Thr Tyr Lys  
1 5 10 15

Phe Ile Pro Ser  
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<210> 22  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 22  
Ala Tyr Glu Thr Tyr Lys Phe Ile Pro Ser Leu Glu Ala Ala Val Lys  
1 5 10 15

Gln Ala Tyr Ala  
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<210> 23  
<211> 20  
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<400> 23  
Leu Glu Ala Ala Val Lys Gln Ala Tyr Ala Ala Thr Val Ala Ala Ala



1	5	10	15
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Pro Glu Val Lys  
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<210> 24  
 <211> 20  
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<400> 24  
 Ala Thr Val Ala Ala Pro Glu Val Lys Tyr Ala Val Phe Glu Ala  
 1 5 10 15

Ala Leu Thr Lys  
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<210> 25  
 <211> 20  
 <212> PRT  
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<400> 25  
 Tyr Ala Val Phe Glu Ala Ala Leu Thr Lys Ala Ile Thr Ala Met Thr  
 1 5 10 15

Gln Ala Gln Lys  
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<210> 26  
 <211> 20  
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<400> 26  
 Ala Ile Thr Ala Met Thr Gln Ala Gln Lys Ala Gly Lys Pro Ala Ala  
 1 5 10 15

Ala Ala Ala Thr  
20

<210> 27  
 <211> 20  
 <212> PRT  
 <213> Escherichia coli

<400> 27  
 Ala Gly Lys Pro Ala Ala Ala Ala Thr Gly Ala Ala Thr Val Ala  
 1 5 10 15

Thr Gly Ala Ala  
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<210> 28  
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<212> PRT  
<213> Escherichia coli

<400> 28  
Gly Ala Ala Thr Val Ala Thr Gly Ala Ala Thr Ala Ala Ala Gly Ala  
1 5 10 15  
Ala Thr Ala Ala  
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<210> 29  
<211> 16  
<212> PRT  
<213> Escherichia coli

<400> 29  
Thr Ala Ala Ala Gly Ala Ala Thr Ala Ala Ala Gly Gly Tyr Lys Ala  
1 5 10 15

<210> 30  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 30  
Ile Ala Lys Val Pro Pro Gly Pro Asn Ile Thr Ala Glu Tyr Gly Asp  
1 5 10 15  
Lys Trp Leu Asp  
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<210> 31  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 31  
Ile Ala Lys Val Xaa Pro Gly Xaa Asn Ile Thr Ala Glu Tyr Gly Asp  
1 5 10 15  
Lys Trp Leu Asp  
20

<210> 32  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 32  
Thr Ala Glu Tyr Gly Asp Lys Trp Leu Asp Ala Lys Ser Thr Trp Tyr

1	5	10	15
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Gly Lys Pro Thr  
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<210> 33  
 <211> 20  
 <212> PRT  
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<400> 33  
 Gly Ala Gly Pro Lys Asp Asn Gly Gly Ala Cys Gly Tyr Lys Asn Val  
 1 5 10 15

Asp Lys Ala Pro  
20

<210> 34  
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<400> 34  
 Gly Ala Gly Pro Lys Asp Asn Gly Gly Ala Cys Gly Tyr Lys Asp Val  
 1 5 10 15

Asp Lys Ala Pro  
20

<210> 35  
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<400> 35  
 Cys Gly Tyr Lys Asp Val Asp Lys Ala Pro Phe Asn Gly Met Thr Gly  
 1 5 10 15

Cys Gly Asn Thr  
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<210> 36  
 <211> 22  
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<400> 36  
 Cys Gly Phe Asn Gly Met Thr Gly Cys Gly Asn Thr Pro Ile Phe Lys  
 1 5 10 15

Asp Gly Arg Gly Cys Gly  
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<210> 37  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 37  
Pro Ile Phe Lys Asp Gly Arg Gly Cys Gly Ser Cys Phe Glu Ile Lys  
1 5 10 15  
Cys Thr Lys Pro  
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<210> 38  
<211> 20  
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<400> 38  
Ser Cys Phe Glu Ile Lys Cys Thr Lys Pro Glu Ser Cys Ser Gly Glu  
1 5 10 15  
Ala Val Thr Val  
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<210> 39  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 39  
Glu Ser Cys Ser Gly Glu Ala Val Thr Val Thr Ile Thr Asp Asp Asn  
1 5 10 15  
Glu Glu Pro Ile  
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<210> 40  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 40  
Thr Ile Thr Asp Asp Asn Glu Glu Pro Ile Ala Pro Tyr His Phe Asp  
1 5 10 15  
Leu Ser Gly His  
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<210> 41  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 41  
Ala Pro Tyr His Phe Asp Leu Ser Gly His Ala Phe Gly Ser Met Ala  
1 5 10 15

Asp Asp Gly Glu  
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<210> 42  
<211> 20  
<212> PRT  
<213> Escherichia coli

<400> 42  
Ala Phe Gly Ser Met Ala Asp Asp Gly Glu Glu Gln Lys Leu Arg Ser  
1 5 10 15

Ala Gly Glu Leu  
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<210> 43  
<211> 20  
<212> PRT  
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<400> 43  
Glu Gln Lys Leu Arg Ser Ala Gly Glu Leu Glu Leu Gln Phe Arg Arg  
1 5 10 15

Val Lys Cys Lys  
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<210> 44  
<211> 20  
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<400> 44  
Glu Leu Gln Phe Arg Arg Val Lys Cys Lys Tyr Pro Asp Asp Thr Lys  
1 5 10 15

Pro Thr Phe His  
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<210> 45  
<211> 20  
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Tyr Pro Asp Asp Thr Lys Pro Thr Phe His Val Glu Lys Ala Ser Asn  
1 5 10 15

Pro Asn Tyr Leu  
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<210> 46  
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Val Glu Lys Ala Ser Asn Pro Asn Tyr Leu Ala Ile Leu Val Lys Tyr  
1 5 10 15

Val Asp Gly Asp  
20

<210> 47  
<211> 20  
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<400> 47  
Val Glu Lys Gly Ser Asn Pro Asn Tyr Leu Ala Ile Leu Val Lys Tyr  
1 5 10 15

Val Asp Gly Asp  
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<210> 48  
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Ala Ile Leu Val Lys Tyr Val Asp Gly Asp Gly Asp Val Val Ala Val  
1 5 10 15

Asp Ile Lys Glu  
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<210> 49  
<211> 20  
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Gly Asp Val Val Ala Val Asp Ile Lys Glu Lys Gly Lys Asp Lys Trp  
1 5 10 15

Ile Glu Leu Lys  
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<210> 50

<211> 20  
<212> PRT  
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Lys Gly Lys Asp Lys Trp Ile Glu Leu Lys Glu Ser Trp Gly Ala Val  
1 5 10 15

Trp Arg Ile Asp  
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<210> 51  
<211> 20  
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Thr Pro Asp Lys Leu Thr Gly Pro Phe Thr Val Arg Tyr Thr Thr Glu  
1 5 10 15

Gly Gly Thr Lys  
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<210> 52  
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Val Arg Tyr Thr Thr Glu Gly Gly Thr Lys Ser Glu Val Glu Asp Val  
1 5 10 15

Ile Pro Glu Gly  
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<400> 53  
Ser Glu Val Glu Asp Val Ile Pro Glu Gly Trp Lys Ala Asp Thr Ser  
1 5 10 15

Tyr Ser Ala Lys  
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<210> 54  
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<220>

<223> all occurrences of Xaa=hydroxyproline

<400> 54

Ala Asp Ala Gly Tyr Thr Xaa Ala Ala Ala Ala Thr Xaa Ala Thr Xaa  
1 5 10 15

Ala Ala Thr Xaa Ala Ala Ala Gly Gly Lys Ala Thr Thr Asp Glu Gln  
20 25 30

Lys

<210> 55

<211> 20

<212> PRT

<213> Escherichia coli

<400> 55

Ala Lys Ser Thr Trp Tyr Gly Lys Pro Thr Gly Ala Gly Pro Lys Asp  
1 5 10 15

Asn Gly Gly Ala  
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<210> 56

<211> 20

<212> PRT

<213> Escherichia coli

<400> 56

Glu Ser Trp Gly Ala Val Trp Arg Ile Asp Thr Pro Asp Lys Leu Thr  
1 5 10 15

Gly Pro Phe Thr  
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<210> 57

<211> 1181

<212> DNA

<213> Escherichia coli

<220>

<221> CDS

<222> (53)..(961)

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<222> (125)

<400> 57

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Met Ala

gtg cag cag tac acg gtg gcg ctg ttc ctg gcc gtg gcc tcg tgt cgg 106



Val	Gln	Gln	Tyr	Thr	Val	Ala	Leu	Phe	Leu	Ala	Val	Ala	Ser	Cys	Arg		
	-20						-15					-10					
gcc	cgc	gcc	tcc	tac	gcc	gcc	gac	gcc	ggc	tac	gcc	ccc	gcc	act	ccc	154	
Ala	Arg	Ala	Ser	Tyr	Ala	Ala	Asp	Ala	Gly	Tyr	Ala	Pro	Ala	Thr	Pro		
	-5				-1	1				5					10		
gcc	acc	ccg	gct	acc	ccc	gcg	gcc	cca	ggc	gca	gcg	gtg	cca	gca	ggg	202	
Ala	Thr	Pro	Ala	Thr	Pro	Ala	Ala	Pro	Gly	Ala	Ala	Val	Pro	Ala	Gly		
			15					20					25				
aag	gcg	gcg	acc	gag	gag	cag	aag	ctg	atc	gag	aag	atc	aac	gcc	ggc	250	
Lys	Ala	Ala	Thr	Glu	Glu	Gln	Lys	Leu	Ile	Glu	Lys	Ile	Asn	Ala	Gly		
			30					35					40				
ttc	aag	gcc	gcc	gtg	gcg	gcc	gcc	gcg	ggc	gtc	ccg	cca	ggc	gac	aag	298	
Phe	Lys	Ala	Ala	Val	Ala	Ala	Ala	Ala	Gly	Val	Pro	Pro	Gly	Asp	Lys		
	45						50					55					
tac	aag	acg	ttc	gtc	gaa	acc	ttc	ggc	aag	gcc	tcc	aac	aag	gcc	ttc	346	
Tyr	Lys	Thr	Phe	Val	Glu	Thr	Phe	Gly	Lys	Ala	Ser	Asn	Lys	Ala	Phe		
	60					65					70						
ctg	ggg	gac	ctc	ccg	acc	aac	tac	gcc	gat	gtc	aac	tcc	agg	gcc	cag	394	
Leu	Gly	Asp	Leu	Pro	Thr	Asn	Tyr	Ala	Asp	Val	Asn	Ser	Arg	Ala	Gln		
	75				80					85					90		
ctc	acc	tcg	aag	ctc	gac	gcc	gcc	tac	aag	ctc	gcc	tac	gac	gcc	gcc	442	
Leu	Thr	Ser	Lys	Leu	Asp	Ala	Ala	Tyr	Lys	Leu	Ala	Tyr	Asp	Ala	Ala		
				95				100						105			
cag	ggc	gcc	acc	ccc	gag	gcc	aag	tac	gac	gcc	tac	gtc	gcc	acc	ctc	490	
Gln	Gly	Ala	Thr	Pro	Glu	Ala	Lys	Tyr	Asp	Ala	Tyr	Val	Ala	Thr	Leu		
			110					115					120				
agc	gag	gcg	ctc	cgc	atc	atc	gcc	ggc	acc	ctc	gag	gtc	cac	gcc	gtc	538	
Ser	Glu	Ala	Leu	Arg	Ile	Ile	Ala	Gly	Thr	Leu	Glu	Val	His	Ala	Val		
	125						130					135					
aag	ccc	gct	gcc	gag	gag	gtc	aag	cct	atc	ccc	gcc	gga	gag	ctg	cag	586	
Lys	Pro	Ala	Ala	Glu	Glu	Val	Lys	Pro	Ile	Pro	Ala	Gly	Glu	Leu	Gln		
	140					145					150						
atc	gtc	gac	aag	att	gac	gtc	gcc	ttc	aga	act	gcc	gcc	acc	gcc	gcc	634	
Ile	Val	Asp	Lys	Ile	Asp	Val	Ala	Phe	Arg	Thr	Ala	Ala	Thr	Ala	Ala		
	155				160					165					170		
aac	gcc	gcc	ccc	acc	aac	gac	aag	ttc	acc	gta	ttc	gag	acc	acc	ttt	682	
Asn	Ala	Ala	Pro	Thr	Asn	Asp	Lys	Phe	Thr	Val	Phe	Glu	Thr	Thr	Phe		
				175				180						185			
aac	aag	gcc	atc	aag	gag	agc	acg	ggc	ggc	acc	tac	gag	agc	tac	aag	730	
Asn	Lys	Ala	Ile	Lys	Glu	Ser	Thr	Gly	Gly	Thr	Tyr	Glu	Ser	Tyr	Lys		
			190					195					200				
ttc	att	ccc	acc	ctt	gag	gcc	gcc	gtt	aag	cag	gcc	tac	gcc	gcc	acc	778	
Phe	Ile	Pro	Thr	Leu	Glu	Ala	Ala	Val	Lys	Gln	Ala	Tyr	Ala	Ala	Thr		

205	210	215	
gtc gca tcc gcg ccg gag gtc aag tac gcc gtc ttt gag acc gcg ctg			826
Val Ala Ser Ala Pro Glu Val Lys Tyr Ala Val Phe Glu Thr Ala Leu			
220	225	230	
aaa aag gcg gtc acc gcc atg tcc gag gcc cag aag gaa gcc aag ccc			874
Lys Lys Ala Val Thr Ala Met Ser Glu Ala Gln Lys Glu Ala Lys Pro			
235	240	245	250
gcc acc gcc acc ccg acc ccc acc gca act gcc gcg gcc gcg gtg gcc			922
Ala Thr Ala Thr Pro Thr Pro Thr Ala Thr Ala Ala Ala Ala Val Ala			
255	260	265	
acc aac gcc gcc ccc gtc gct gct ggt ggc tac aaa atc tgatcaactc			971
Thr Asn Ala Ala Pro Val Ala Ala Gly Gly Tyr Lys Ile			
270	275		
gctagcaata tacacatcca tcatgcacat atagagctgt gtatgtatgt gcatgcatgc			1031
cgtggcgccg cgcaagtttg ctcataatta attcttggtt ttcgttgctt gcatccacga			1091
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 <213> Escherichia coli

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                     -20                    -15                    -10  
 Cys Arg Ala Arg Ala Ser Tyr Ala Ala Asp Ala Gly Tyr Ala Pro Ala  
                     -5                    -1    1                    5  
 Thr Pro Ala Thr Pro Ala Thr Pro Ala Ala Pro Gly Ala Ala Val Pro  
                     10                    15                    20  
 Ala Gly Lys Ala Ala Thr Glu Glu Gln Lys Leu Ile Glu Lys Ile Asn  
                     25                    30                    35                    40  
 Ala Gly Phe Lys Ala Ala Val Ala Ala Ala Gly Val Pro Pro Gly  
                     45                    50                    55  
 Asp Lys Tyr Lys Thr Phe Val Glu Thr Phe Gly Lys Ala Ser Asn Lys  
                     60                    65                    70  
 Ala Phe Leu Gly Asp Leu Pro Thr Asn Tyr Ala Asp Val Asn Ser Arg  
                     75                    80                    85  
 Ala Gln Leu Thr Ser Lys Leu Asp Ala Ala Tyr Lys Leu Ala Tyr Asp  
                     90                    95                    100

Ala Ala Gln Gly Ala Thr Pro Glu Ala Lys Tyr Asp Ala Tyr Val Ala  
 105 110 115 120  
 Thr Leu Ser Glu Ala Leu Arg Ile Ile Ala Gly Thr Leu Glu Val His  
 125 130 135  
 Ala Val Lys Pro Ala Ala Glu Glu Val Lys Pro Ile Pro Ala Gly Glu  
 140 145 150  
 Leu Gln Ile Val Asp Lys Ile Asp Val Ala Phe Arg Thr Ala Ala Thr  
 155 160 165  
 Ala Ala Asn Ala Ala Pro Thr Asn Asp Lys Phe Thr Val Phe Glu Thr  
 170 175 180  
 Thr Phe Asn Lys Ala Ile Lys Glu Ser Thr Gly Gly Thr Tyr Glu Ser  
 185 190 195 200  
 Tyr Lys Phe Ile Pro Thr Leu Glu Ala Ala Val Lys Gln Ala Tyr Ala  
 205 210 215  
 Ala Thr Val Ala Ser Ala Pro Glu Val Lys Tyr Ala Val Phe Glu Thr  
 220 225 230  
 Ala Leu Lys Lys Ala Val Thr Ala Met Ser Glu Ala Gln Lys Glu Ala  
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 Lys Pro Ala Thr Ala Thr Pro Thr Pro Thr Ala Thr Ala Ala Ala Ala  
 250 255 260  
 Val Ala Thr Asn Ala Ala Pro Val Ala Ala Gly Gly Tyr Lys Ile  
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Ala Ala Thr Xaa  
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Ala Thr Xaa Ala Thr Xaa Ala Ala Thr Xaa Ala Ala Ala Gly Gly Lys  
1 5 10 15

Ala Thr Thr Asp  
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